

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

Structure for Water Control

(Number)

Code 587

DEFINITION

A structure in an irrigation, drainage, or other water management system that conveys water, controls the direction or rate of flow, or maintains a desired water surface elevation.

PURPOSES

To control the stage, discharge, distribution, delivery, or direction of flow of water in open channels or water use areas. Also used for water quality control, such as sediment reduction, temperature regulation or nitrate concentration reduction. These structures are also used to protect fish and wildlife and other natural resources.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies wherever a permanent structure is needed as an integral part of an irrigation, drainage, or other water-control systems to serve one or more of the following functions:

1. To conduct water from one elevation to a lower elevation within, to, or from a ditch, channel, or canal. Typical structures: drops, chutes, turnouts, surface water inlets, head gates, pump boxes, and stilling basins.
2. To control the elevation of water in drainage or irrigation ditches. Typical structure: checks.

3. To control the division or measurement of irrigation water. Typical structures: division boxes and water measurement devices.

4. To keep trash, debris, or weed seeds from entering pipelines. Typical structure: debris screens.

5. To control the direction of channel flow resulting from high water or backflow from flooding. Typical structure: drainage gates.

6. To control the level of a water table or to remove surface or subsurface water from adjoining land, or to manage water levels for wildlife or recreation. Typical structures: water level control structures, pipe drop inlets, and box inlets.

7. To provide water control for recreation or similar purposes.

8. To convey water over, under, or along a ditch, canal, road, railroad, or other barriers. Typical structures: bridges, culverts, flumes, inverted siphons.

9. To modify water flow to provide habitat for fish, wildlife, and other aquatic animals. Typical structures: deflectors, chutes, cold water release, or structures to make pools and riffles.

10. To modify water quality by providing a means to reduce nitrates by denitrification.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

CRITERIA

Structures shall be designed on an individual job basis, or applicable NRCS standard drawings shall be adapted to meet site conditions and functional requirements. They shall be part of an approved and overall engineering plan for irrigation, drainage, wildlife, recreation, channel improvement, or similar purposes.

The plan shall specify the location, grades, dimensions, materials, and hydraulic and structural requirements for the individual structure. Provisions must be made for necessary maintenance. Care must be used to insure that the area's visual resources are not damaged. If watercourse fisheries are important, special precautions or design features may be needed to insure continuation of fish migration.

Vegetative establishment

If soil and climatic conditions permit, a protective cover of vegetation shall be established on all disturbed earth surfaces in accordance with Standards and Specifications Streambank and Shoreline Protection (580). If soil or climatic conditions preclude the use of vegetation and protection is needed, nonvegetative means, such as mulches or gravel, may be used. In some places, temporary vegetation may be used until permanent vegetation can be established. The structure can be fenced, if necessary, to protect the vegetation.

CONSIDERATIONS

Structure for water control should be part of the treatment needed to protect the soil, water, plant, animal and air resources. The management system must be planned to prevent excessive maintenance and operation problems.

Effects on water quantity and quality shall be considered. This practice is expected to have only a minor effect on the quantity of surface and ground water. In some applications, the storage of runoff or soil water retention, caused by the practice, may be significant.

When this practice is used to conduct water to a lower elevation within, to or from a ditch, a

channel or canal, there should be little significant effects on the quality of surface or ground water. Where this practice is used to control the elevation of water in drainage or irrigation ditches, a stable design would reduce bank erosion and channel scour. Sediment and attached pollutants will be reduced to the surface water.

Where the practice is used to keep trash, debris, weed seeds from entering pipelines or to control the direction of backwater from flooding, little effect is anticipated on the quality of surface or ground water.

Where the practice is used to control the level of the water table or to remove surface or subsurface water from adjoining land or to flood land to manage water levels for wildlife or recreation, it may increase infiltration and percolation by supplying additional water. The additional water may carry additional soluble pollutants to the ground water. When used to remove drainage water from the surface or subsurface, substances may be delivered directly to surface water. Water temperatures in the summer months may be increased.

Where the practice is used to convey water over, under, or along a ditch, road, railroad, or other barriers, there may be little effect on the quality of surface or ground water.

Where the practice is used to modify water flow to provide habitat for fish, wildlife, and other aquatic animals, the dissolved oxygen content of the stream may increase and the water temperature may be lowered. This may be brought about by aeration through design features to create turbulence or increased water volume. The source of additional water may or may not be cooler and the temperature may increase.

Each application must be evaluated considering the hydrologic and material characteristics of the site.

Special attention shall be given to maintaining and improving visual resources and habitat for fish and wildlife where applicable. The

landowner/user shall be advised if wetlands will be affected and USDA-NRCS wetland policy will apply. All work planned shall be in compliance with General Manual Title 450-GM, Part 405, Subpart A, Compliance With Federal, State, and Local Laws and Regulations. If archaeological and historic properties are encountered, the USDA-NRCS policy in General Manual Title 420-GM, Part 401 shall be followed.

PLANS AND SPECIFICATIONS

Plans and specifications for installing structures for water control shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Construction specifications

The construction specifications for Structure for Water Control will be according to construction specifications for Standard and Specifications for Grade Stabilization Structure (410).

OPERATION AND MAINTENANCE

A maintenance program shall be established by the landowner/user to maintain the vegetative cover and the structure for water control.

1. Do not graze protected areas around the structure during vegetative establishment and when soil conditions are wet.
2. Fertilize to maintain a vigorous vegetative cover. Caution should be used in applying fertilizer to prevent degradation of water quality.
3. Periodically inspect the structure for any undermining or instability and if any problems are observed, take immediate action to protect from further damage.
4. Reestablish vegetative cover immediately where scour erosion has removed established seeding.
5. Control undesirable trees and brush growth around the structure as needed by hand, mechanical or chemical means. Only use chemicals recommended for this purpose.
6. All trash and debris that accumulate around the structure should be removed.